

Remarks

Required corrections identified in the specification have been made as noted above.

5 A new set of drawings with the required corrections are being submitted herewith for the approval of the Examiner.

Claims 1-9 were initially in the application, claim 1-5 and 7-9 were rejected, and claim 6 was objected to. Claims 1-9 are deleted by this amendment.

10 More specifically claims 1-3 and 8 were rejected under 35 USC 103(a) as being unpatentable over Daniel et al (US Pat. No. 5,860,058 in view of Frost (US Pat. No. 4,284,848).

15 Claims 4 and 7 were rejected under 35 USC 103(a) as being unpatentable over Daniel et and Frost as applied to claim 2, and further in view of Chang et al US Pat. No. 5,690,067.

Claim 5 was rejected as being unpatentable over Daniel et al and Frost as applied to claim 2, and further in view of Benker et al US Pat. No. 6,023,623. Claim 6 was objected to.

20 The rejection of claims 1-5 and 7-9 is respectfully traversed. In order to more clearly distinguish over the cited art, new independent claims 10, 11 and 17 and dependent claims 12-16 have been added to the case in lieu of canceled claims 1-9

The basic cited art is (are) the patents to Daniel et

and Frost. Daniel et al, does not describe any system for permitting multiple conversations from different routes going through a common node with no blocking or conflict problems. It is known that simultaneous transmission and reception in a band of frequencies is troublesome in that spurious signals from the transmission easily and accidentally enter the receiver. As is known, band conflict problems cause duplex operation problems.

For example in Daniel Fig. 1, the two left (as oriented in the figure) satellites are indicated as being in two way communication (doubled headed arrows) with the control facility 22/20. These same two satellites are also indicated as being in two-way communication with each other. It appears to be quite clear that without extra bands in addition to the two bands required for duplex mobile to satellite communication, the Daniel system will not work properly, i.e., it will have band conflict problems. For example, if the control facility transmitted in Band 1 to the left most satellite, to avoid band conflict, the left most satellite would receive in Band 1 and transmit in Band 2 to the middle satellite. Then to avoid band conflict, the middle satellite would listen in Band 2 and transmit in Band 1 to the control facility. Accordingly, in this scenario, the control facility would be both receiving and transmitting in

Band 1. Consequently, there would be a band conflict problem at the control facility. This problem gets worse and involves other units as more units enter the system.

In Frost, problems related to duplex operation also occur. For example, in Frost Fig. 2 a subscriber unit with two duplex radios is shown. If it is presumed that both radios operate in a similar manner to match the explanation relative to Frost Figs. 10a and 10b, then the subscriber unit would be capable of operating as a repeater. However, this subscriber unit would then be unable to communicate with other subscriber units as the bands would not line up. If it is presumed that the two radios in Fig. 2 operate in reversed bands, then the radios would experience duplex operating problems. Furthermore, some of the routes in Fig. 14 appear to lead to similar problems as discussed above with respect to Daniels, when bands are selected for transmission and reception.

In summary neither Frost nor Daniels disclose specific regarding band selection, and neither addresses the choice of bands in a radio routing system as it relates to duplex operation problems.

Claim 10 is a method claim which in its entirety recites a method that clearly distinguishes over Frost or Daniels, taken either singly or in combination. Importantly and

basically, claim 10 recites a method enabling duplex operation between base sites to remotes, and base sites to blind nodes in just two bands. Such method is not described or suggested in any proposed combination of Daniels and Frost.

Claim 11 is an apparatus claim which recites the invention as embodied in a specific structure. Claim 11 includes the recitation of routing tables for enabling the routing of calls, and apparatus enabling simultaneous base site to remote site communication and routing functions in two bands of frequencies, and without duplex operating problems.

In contrast to Frost and Daniels, referring now to the inventive system as shown in Figures 3 and 5 of the application, the base sites are laid out to give coverage to mobiles (remotes) moving between adjacent sites.

Consequently, adjacent base sites typically have good line of sight communication between them. In such a system there would be no need to add repeaters. In the inventive system, intermediate nodes are added to the system. The blind nodes provide a switching of bands to enable the base sites to simultaneously communicate with multiple mobiles and simultaneously communicate with multiple base sites. This is done within a two band parameter.

In the present invention, when a node performs a simultaneous routing and mobile connection function, the assignment of bands is such that the conflict problem is eliminated. Daniel et al offers no suggestion as to how routes are created and set up.

Frost discloses a system wherein intermediate subscribers act as repeaters to connect distant users to a base site. Frost states that in his system (see column 4 at lines 37-40) "subscribers are temporarily blocked from communicating via radio channels as long as the subscriber site is used as a repeater." Thus neither Frost nor Daniels show or suggest blind nodes that transmit simultaneous multiple transmissions in the mobile transmit band to selected base sites while receiving multiple transmissions in the mobile receive band.

It is respectfully submitted that there is nothing in the Frost or Daniels et al taken either individually or in combination that discloses or suggests a system that performs both multiple base to remote communications and multiple base to base communication in but two bands.

Importantly, in contrast to Daniel and Frost, in the present invention, the blind nodes and the bases are both capable of simultaneous multiple communications without any blocking.

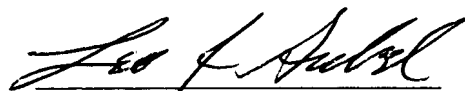
Independent claims 10 and 11 are therefore believed to specifically distinguish over the cited art.

Dependent claim claims 12-16 are all dependent on claims 11 and are believed patentable under the same reasoning as claim 11.

Claim 17 is an independent claim, and relates to a specific method which addresses the unique problem of two fixed sites each with antenna beam capabilities for dynamically setting up a communications path by selecting appropriate matched beams. For example referring to Fig. 4 of the application, the system as claimed in claim 17 can determine whether beam 1188-C is to be matched with beam 1133-E or whether beam 1188-B is to be matched with beam 1133-F. Chang US Patent No.5,890,067 shows a beam selection problem as applied to a mobile, which mobile presumably has no antenna beam selection choice. Consequently, the features that the application and claim 17 relate to, does not exist in Chang.

Favorable action on the claims 10-17 now in the case is earnestly solicited.

Respectfully submitted,



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Appendix A

Page 4 of specification (enclosed)
Abstract (enclosed)

Figure 6.

In land line telephony the present trend is to replace conventional relay closures and dedicated lines by packets of data that are routed along common lines. In the application of the invention described herein below, the inventive concepts can be utilized to support packet data.

Refer to Figure 1 which shows the prior art or current technology. In this prior art each radio is a duplex pair with a transmitter and receiver. Each radio has a circuit back to the cellular switch (or drop). The dashed lines show the control channels. In many installations of the cellular and routing system described herein, wire lines are already present that wire (connect) the base sites to various exchanges and various drops. Because of the limited radio spectrum available, it is desirable to use wire lines whenever they go to the proper destination, as the radio spectrum is too valuable to waste.

Refer to Figure 2 which shows the inventive method wherein at base site B each radio pair is wired to a relay at base site B that can be used to route the call to either the drop 14 that is used for long distance calls or the drop 15 that is used for local calls. Other base sites of the system would be similarly connected. Note, of course, that sites in low usage areas would still be connected in the prior art manner.

In a preferred embodiment of the invention, routes are created automatically as disclosed in referenced patent US No. 5,793,842. In the referenced patent the system includes multiple nodes and links between the nodes that are combined into routes that route calls to a desired drop. In another embodiment of the system explained herein, the base site uses tables are manually loaded into the base site computer that will control the routing destination. This

Abstract

A routing system of call connection and call routing for radio telephone communications system including cellular radio systems wherein the mobiles transmit on channels in a first band and the bases transmit on channels in a second band. The routes are selectable from more than one possible route to a desired destination using routing tables to permit different destinations for different calls selectively based on telephone number indications. The system includes multiple blind nodes that do not support direct base to mobile communication. The blind nodes transmitting in the band used for transmission by the mobiles, and nodes receive in the band used for receiving by the mobiles such that the system performs in a limited number of bands of frequencies.

09/383227

6459899

Base Site A
has 3 radiosBase Site B
has 2 radios

Base Site A



Base Site B

Base Site C
has 3 radios

Base Site C

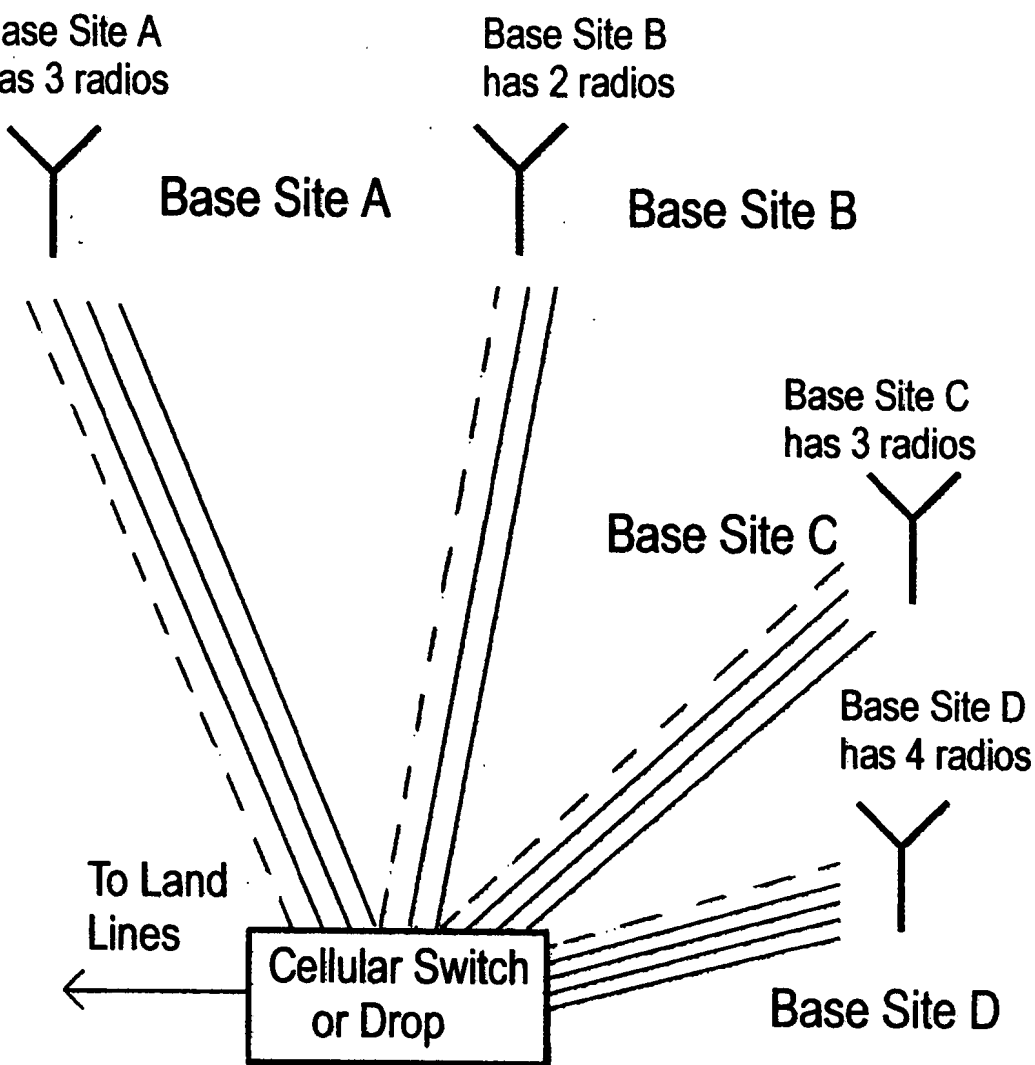
Base Site D
has 4 radios

Base Site D

To Land
LinesCellular Switch
or Drop

Prior Art

Figure 1



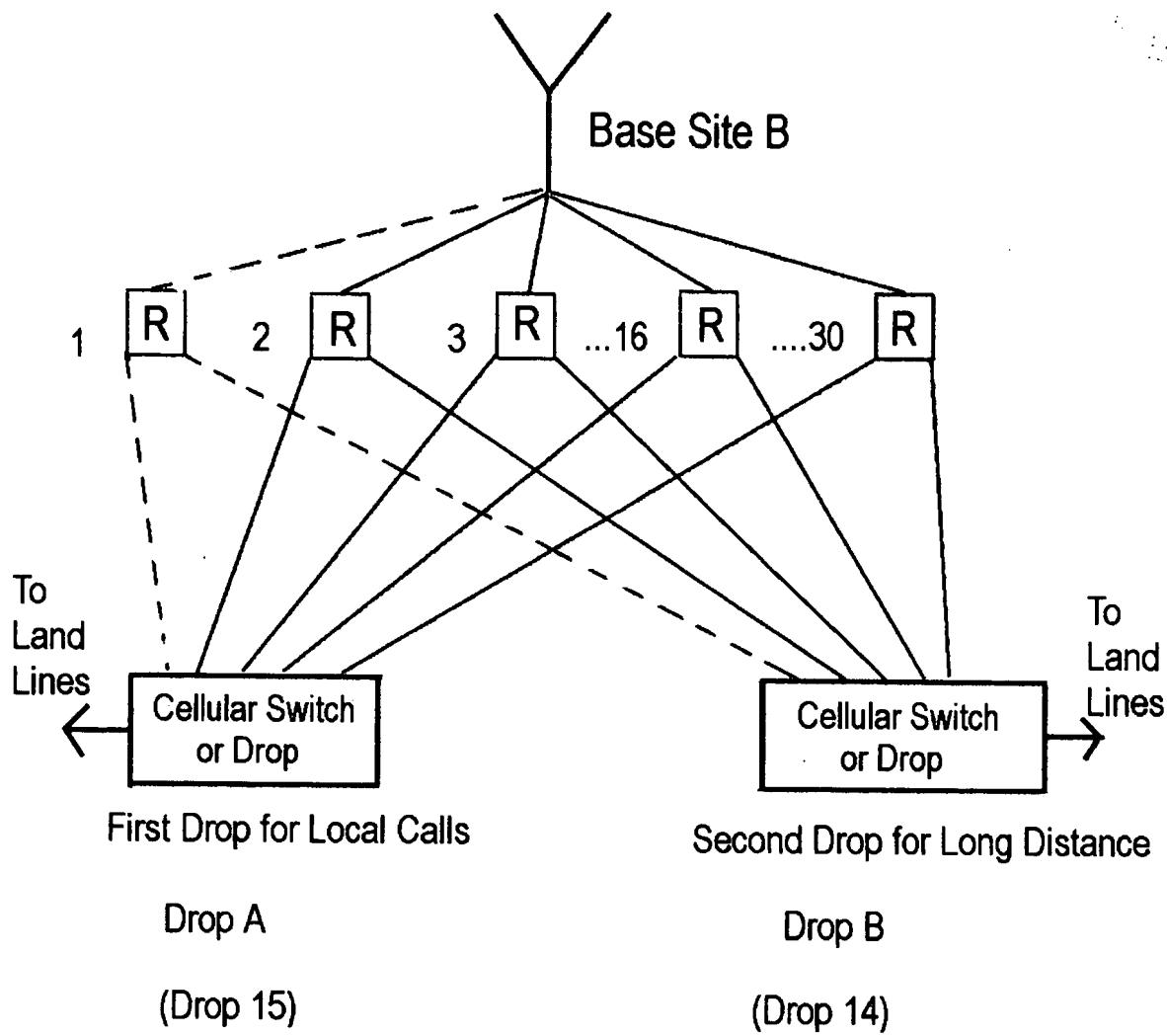


Figure 2

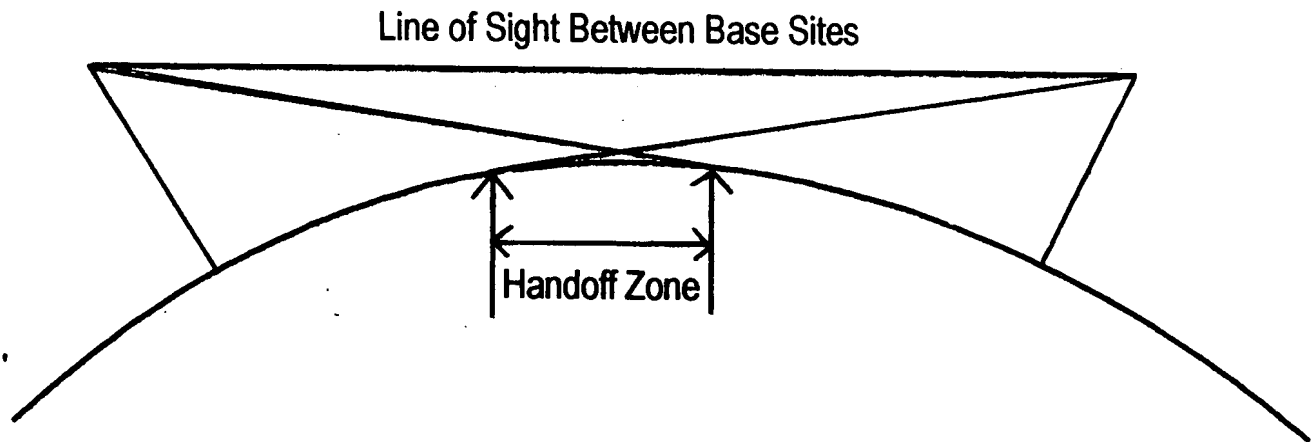
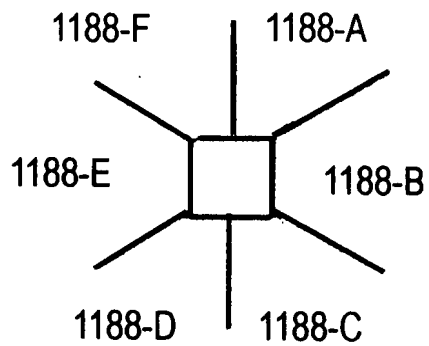
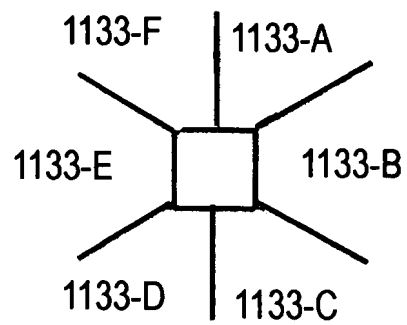


Figure 3



Libertyville Site 1188



Lincolnshire Site 1133

Figure 4

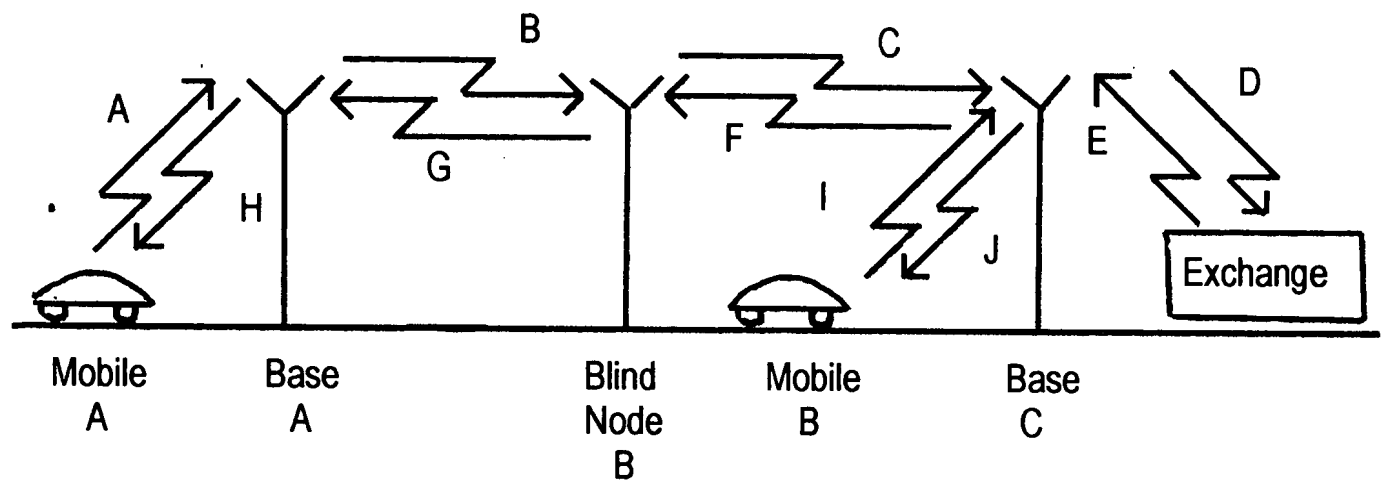
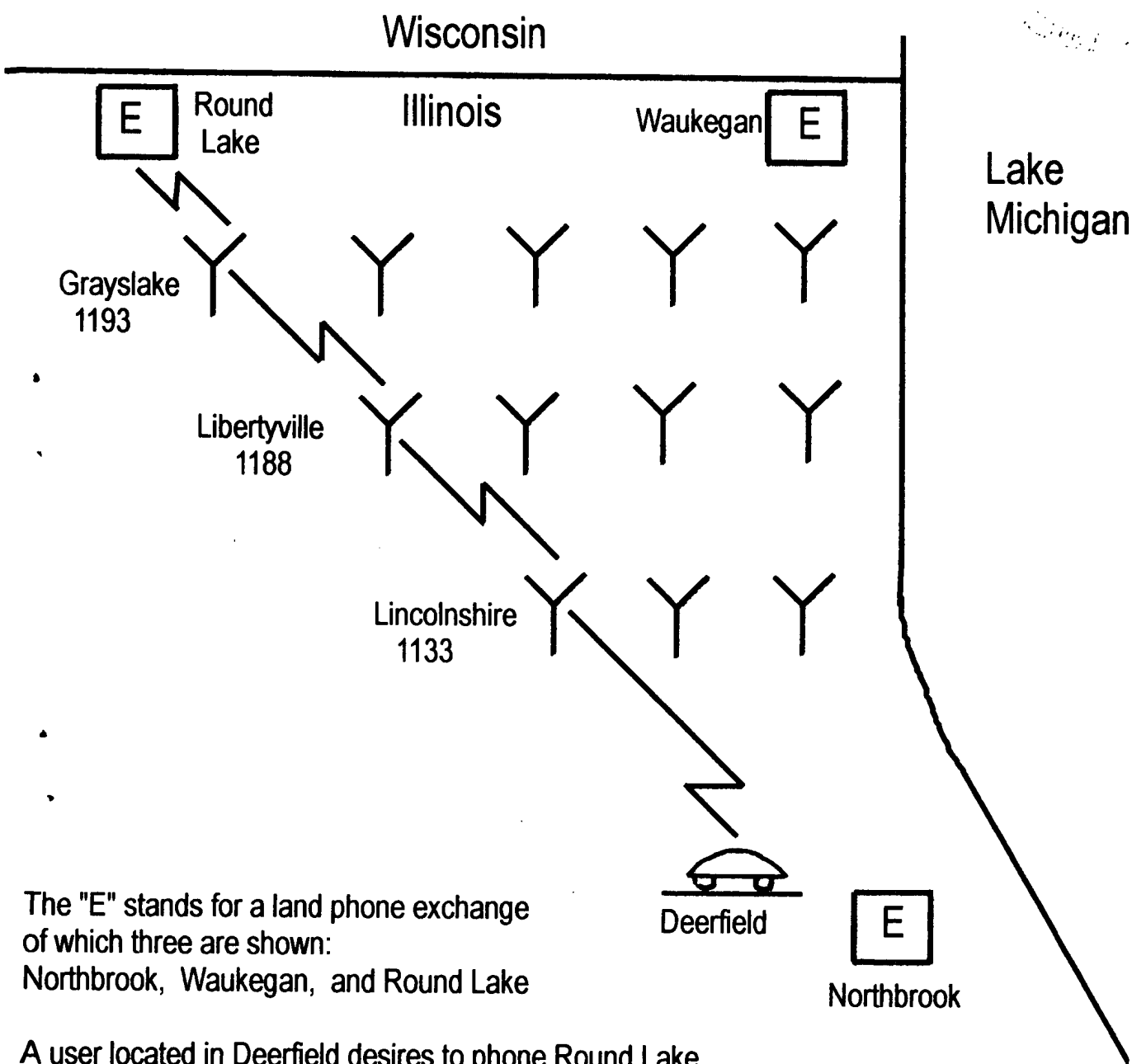


Figure 5



The "E" stands for a land phone exchange of which three are shown:
Northbrook, Waukegan, and Round Lake

- A user located in Deerfield desires to phone Round Lake
- Only some of the cell sites are shown

Figure 6